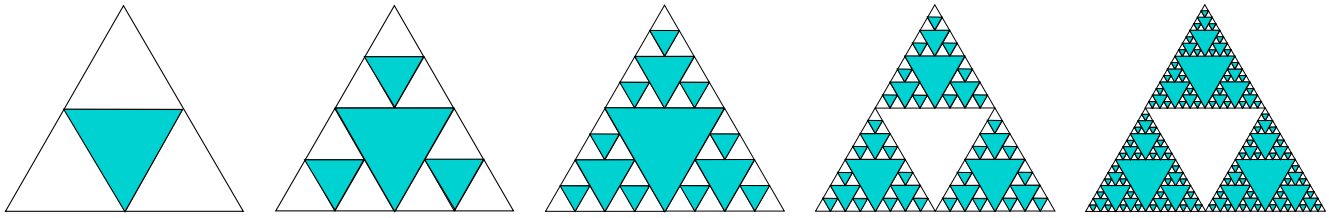
Exploring the Math of Triangles



- Assume the original largest triangle has area of 1.0. Fill in the Table:

Iteration	1	2	3	4	5
Number of Shaded Triangles					
Area of smallest Shaded Triangle					
Total Shaded Area					

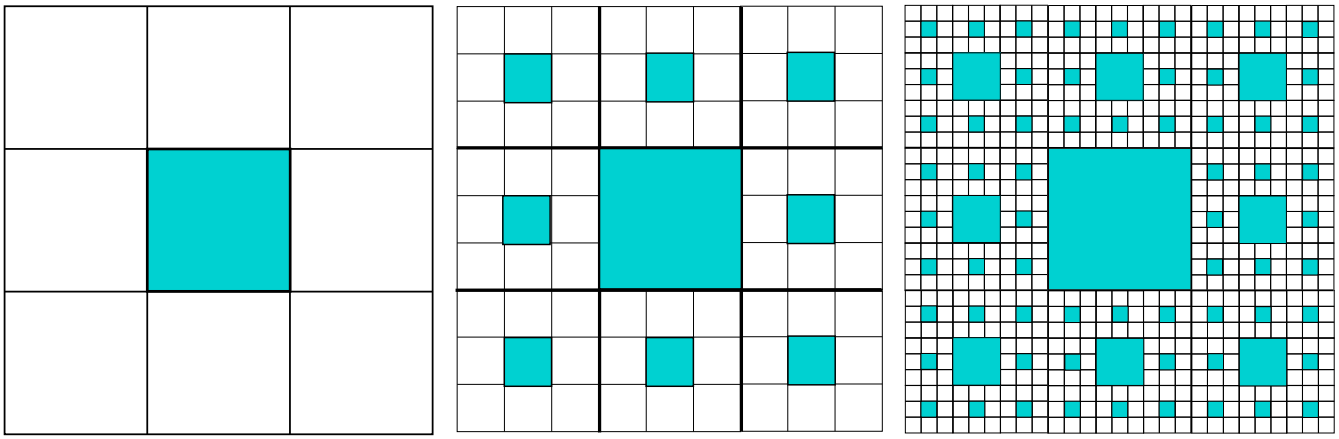
- Find a pattern for the number of shaded triangles (the values in the first row of the table). Determine a formula for the number of shaded triangles at the n^{th} iteration.

- Find a pattern for the area of one shaded triangle (the values in the second row). Determine a formula for the area of one shaded triangle at the n^{th} iteration.

- Find a pattern in the values for the total shaded area. Determine a formula for the total area at the n^{th} stage.

- What happens to these values as the number of iterations grows large?

Exploring the Math of Squares



- Assume the initial, largest square has area 1.0. Fill in the Table:

Iteration	1	2	3	4
Number of Shaded Squares				
Area of smallest Shaded Square				
Total Shaded Area				

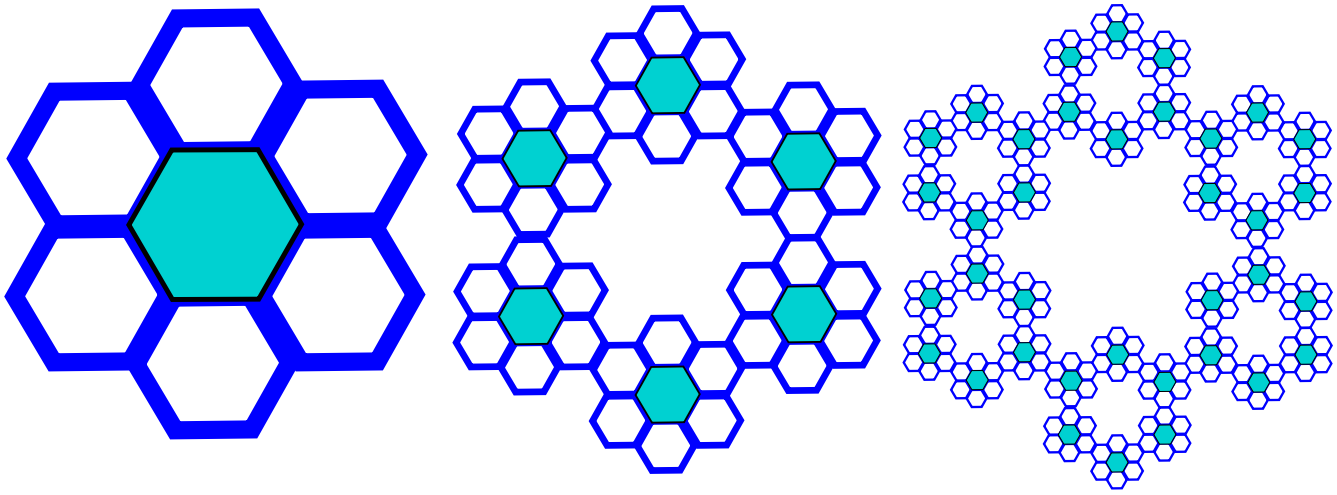
- Find a pattern for the number of shaded squares (the values in the first row of the table). Determine a formula for the number of shaded squares at the n^{th} iteration.

- Find a pattern for the area of one shaded square (the values in the second row). Determine a formula for the area of one shaded square at the n^{th} iteration.

- Find a pattern in the values for the total shaded area. Determine a formula for the total area at the n^{th} iteration.

- What happens to these values as the number of iterations grows very large?

Exploring the Math of Hexagons



- Fill in the Table:

Iteration	1	2	3
Number of Shaded Hexagons			
Number of Hexagons Not Shaded			
Total Number Hexagons			

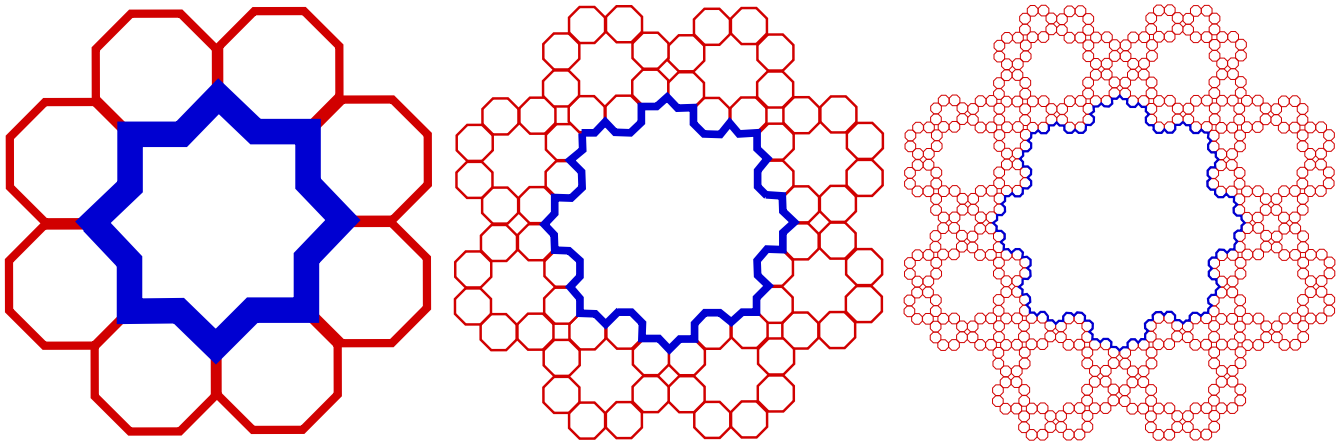
- Find a pattern in the values for the number of shaded hexagons. Determine a formula for the number of shaded hexagons at the n^{th} iteration.

- Find a pattern in the values of the number of surrounding hexagons. Build a formula for the number of surrounding hexagons at the n^{th} iteration.

- Find a pattern in the values for the total number of hexagons. Build a formula for this total at the n^{th} iteration.

- What happens to these values as the number of iterations grows very large?

Exploring the Math of Octagons — 1



- Fill in the Table:

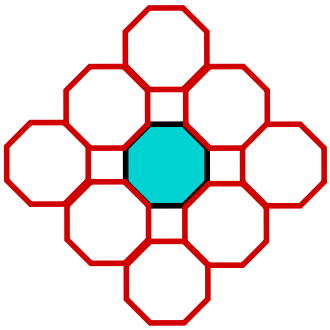
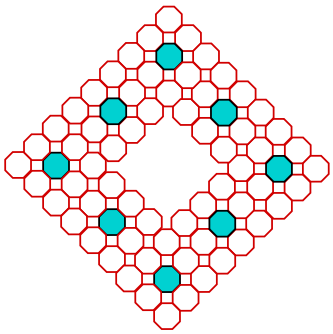
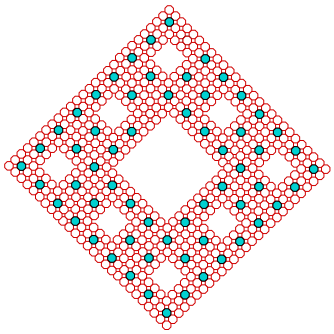
Iteration	1	2	3
Number of Octagons			
Number of Interior Edges	16		

- Find a pattern for the number of octagons. Determine a formula for the number of octagons at the n^{th} iteration.

- What happens to the total number of hexagons as the number of iterations grows very large?

- Find a pattern for the number of interior edges. Determine a formula for the number of such edges at the n^{th} iteration.

Exploring the Math of Octagons — 2

- Fill in the Table:

Iteration	1	2	3
Number of Shaded Octagons			
Total Number of Octagons			
Ratio of Shaded to Total Octagons			

- Find a pattern for the number of shaded octagons at each iteration. Determine a formula for the number of shaded octagons at the n^{th} iteration.

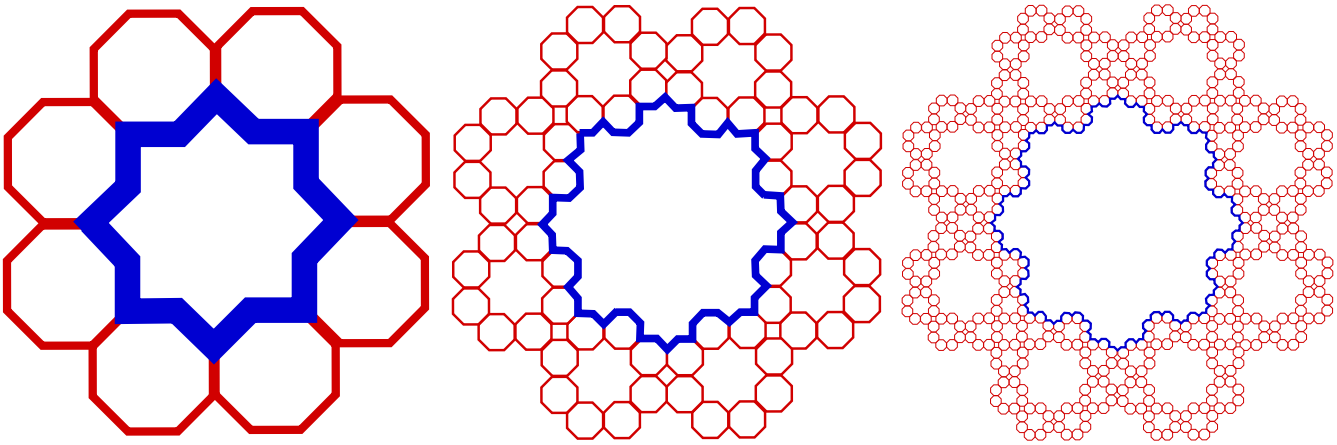
- Find a pattern in the values for the total number of octagons. Determine a formula for the number of octagons at the n^{th} iteration.

- Find a pattern in the values for the ratio of shaded to total octagons. Determine a formula for that ratio at the n^{th} iteration.

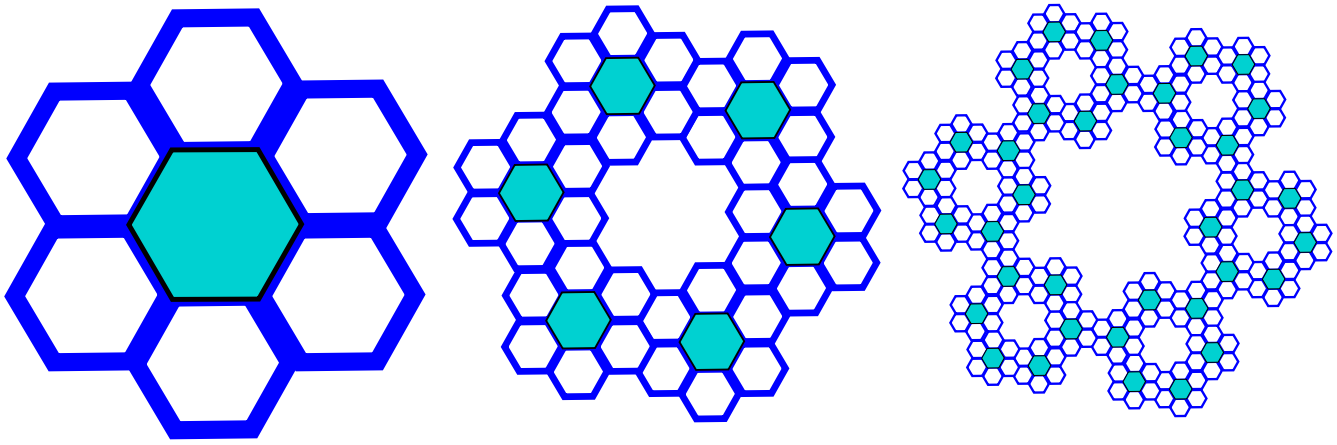
- What happens to these values as the number of iterations grows very large?

In Search of Snowflakes

Using Octagons



Using Hexagons



Figures with Pentagons